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Abstract

SEPARATION OF STABLE ISOTOPES BY THE GAS CENTRIFUGE METHOD INFLUENCE OF THE AXIAL PRESSURE ON THE SEPARATION OF ARGON ISOTOPES

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The installation for stable isotope separation by the gas centrifuge method, set up at this Instituto de Pesquisas Tecnologicas (Institute of Technological Research), São Paulo, Brazil, as well as the experiments performed in order to investigate the influence of the gas pressure at the axis of the centrifuge rotor on the separation of argon isotopes, are described. The installation consists of three thermally controlled countercurrent gas centrifuges, developed, as model ZG 3, by Groth and co-workers. These centrifuges are arranged in a two-stage cascade for the separation of argon isotopes. The description of this cascade, in which each centrifuge may also be operated as a single element, is given.

The influence of the axial pressure on the separation of argon isotopes was investigated with one of these centrifuges, by measuring the enrichment as a function of the throughput of the gas, under variation of the temperature difference between the rotor covers and for several axial pressures of the gas in the centrifuge rotor. The data from these experiments are used in order to calculate the enrichments at total reflux, as well as the separative power of the centrifuge as a function of the gas throughput. The results show that the enrichment and the separative power decrease as the axial pressure decreases and that greater optimal temperature differences between the rotor covers are necessary at the smaller axial pressures. For certain of these temperature differences, the presence of a maximum was observed at the separative power vs. throughput curves, which were provided by the experiments done with the smallest investigated axial pressure. The results are further discussed in view of the dependence of the separative power on the flow profile of the gas inside the centrifuge rotor.